Hospital Preparedness
Infection Prevention and Control for COVID-19

FAQs, Resources and Tips for IPC implementation

Virtual IPC training series

HAI Surveillance Network, AIIMS -ICMR

Part -2

Updated as of 16 May 2020

COVID-19 related Infection Control and Prevention topics discussed in Part 2

- Testing for COVID- 19
- Laboratory Safety
- Environmental cleaning and Laundry
- Hospital Staffing
- Surgical procedures
- Medical certification of COVID-19 deaths and managing dead bodies

Topic – Testing for COVID

What is the incubation period for COVID-19?

- The incubation period of SARS-CoV-2 and other coronaviruses (e.g. MERS-CoV, SARS-CoV) ranges from 2–14 days and the median or the most commonly around five days.
- Asymptomatic infections reported
- The testing strategy and the quarantine/isolation is guided by the incubation period.
  - 14-day isolation and re-testing after the 14 days is based on the longest known incubation of SARS-CoV

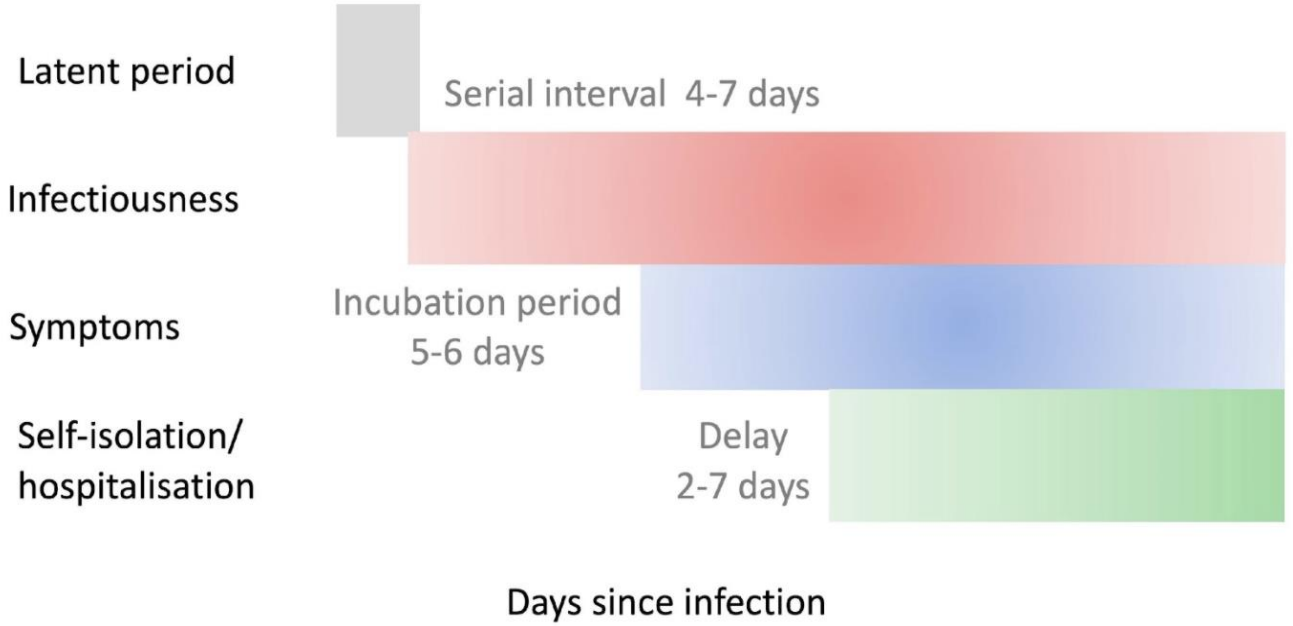


Figure 2. Infection and transmission timeline of COVID-19. Based on supplement to: Anderson et al.. Lancet 2020.

https://www.tibco.com/blog/2020/03/18/covid-19-a-visual-data-science-analysis-and-review/

What are the new symptoms added by CDC for COVID-19?

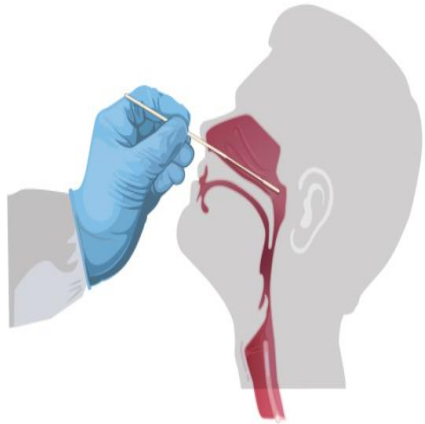
Symptoms for mild symptoms to severe illness that appear 2-14 days after exposure to the virus:

- Previous COVID-19 Symptoms
  - Fever
  - Cough
  - Shortness of breath or difficulty breathing
- Six New Symptoms Added
  - Chills
  - Repeated shaking with chills
  - Muscle pain
  - Headache
  - Sore throat
  - New loss of taste or smell

https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html

Should both nasopharyngeal and oropharyngeal swab be taken for COVID PCR or is one enough?

- As per MoHFW an ICMR guidelines both NP and OP swabs should be collected*
- Sample collection should be done
  - based on prescribed request from a physician only
  - by a trained personal
- Appropriate biosafety and biosecurity precautions should be followed during sample collection and transportation
- Home collection of specimens can be done by private labs following standard precautions



1. **Source-MoHFW, GOI ToT slides on COVID- 19 Laboratory surveillance, March 06 & 07, 2020*
2. *https://www.mohfw.gov.in/pdf/NotificationofICMguidelinesforCOVID19testinginprivatelaboratoriesiIndia.pdf*

What are the CDC's recommendation for upper respiratory specimen collection?

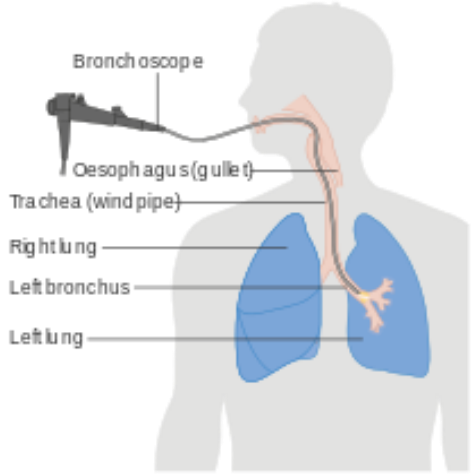
- For initial diagnostic testing for SARS-CoV-2, CDC recommends collecting and testing an upper respiratory specimen. The following are acceptable specimens:
  - A nasopharyngeal (NP) specimen collected by a healthcare professional; or
  - An oropharyngeal (OP) specimen collected by a healthcare professional; or
  - A nasal mid-turbinate swab collected by a healthcare professional or by a supervised onsite self-collection (using a flocked tapered swab); or
  - An anterior nares (nasal swab) specimen collected by a healthcare professional or by onsite or home self-collection (using a flocked or spun polyester swab); or
  - Nasopharyngeal wash/aspirate or nasal wash/aspirate (NW) specimen collected by a healthcare professional
  - Swabs should be placed immediately into a sterile transport tube containing 2-3mL of either viral transport medium (VTM), Amies transport medium, or sterile saline unless a point of care test is used
- Testing lower respiratory tract specimens is also an option

https://www.cdc.gov/coronavirus/2019-ncov/lab/guidelines-clinical-specimens.html

Can lower respiratory tract specimens be tested for SARS-CoV-2?

In addition to nasopharyngeal and oropharyngeal swabs for initial diagnostic testing, CDC recommends testing lower respiratory tract specimens, if available.

- Sputum
  - For patients with a productive cough, sputum should be collected and tested for SARS-CoV-2
  - **The induction of sputum is not recommended**
- BAL
  - If a patient is on invasive mechanical ventilation a lower respiratory tract aspirate or bronchoalveolar lavage sample should be collected and tested as a lower respiratory tract specimen



https://www.cdc.gov/coronavirus/2019-ncov/lab/guidelines-clinical-specimens.html - accessed on 18 April 18 2020

How to collect respiratory samples in intensive care unit (ICU)?

CDC recommends

- Specimen collection should be performed in a single patient room with the door closed.
- Clean and disinfect procedure room surfaces promptly as per environmental infection control guidance.
- Health care worker in the room should wear an N-95 or higher-level respirator (or facemask if a respirator is not available), eye protection, gloves, and a gown.

Method :

Nasopharyngeal swab: Insert a swab into nostril parallel to the palate. Swab should reach depth equal to distance from nostrils to outer opening of the ear. Leave swab in place for several seconds to absorb secretions. Slowly remove swab while rotating it.

Oropharyngeal swab (e.g., throat swab): Swab the posterior pharynx, avoiding the tongue.

Bronchoalveolar lavage, tracheal aspirate : Collect 2-3 mL into a sterile, leak-proof, screw-cap sputum collection cup or sterile dry container.

1. https://www.cdc.gov/coronavirus/2019-ncov/lab/guidelines-clinical-specimens.html
2. www.gov.uk/government/publications/testing -for-wuhan-novel-cov-2019-ncov

Should we allow collection of respiratory samples at home?

- All testing for COVID-19 should be conducted in consultation with a healthcare provider
- Clinical specimens should be collected for routine testing of respiratory pathogens at either clinical or public health labs
- ICMR has allowed collection of samples by private laboratories following biosafety and biosecurity measures*

An alternative is to use a walk in specimen collection kiosk (WISK)

*** https://www.mohfw.gov.in/pdf/NotificationofICMguidelinesforCOVID19testinginprivatelaboratoriesiIndia.pdf**

Laboratory Safety

How should routine lab specimens be handled to avoid COVID transmission?

- Follow "**Standard Precautions"** when handling clinical specimens, all of which may contain potentially infectious materials
- Standard precautions include (but not limited to)
  - hand hygiene
  - use of personal protective equipment (PPE) such as laboratory coats or gowns, gloves

- Follow routine laboratory practices and procedures for decontamination of work surfaces and management of laboratory waste as recommended by CPCB for
  - COVID waste management dated 25 March 2020 and revision 18 April 2020
  - National biomedical waste management rule 2016 amendment 2018 & 2019

1. https://ncdc.gov.in/WriteReadData/l892s/63948609501585568987.pdf
2. https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html

What tests can be done in a BSL2 lab?

The following tests can be done in BSL 2 facilities using **Standard Precautions**:

- Using automated instruments and analyzers
- Processing initial samples
- Staining and microscopic analysis of fixed smears
- Examination of bacterial cultures
- Pathologic examination and processing of formalin-fixed or otherwise inactivated tissues
- Molecular analysis of extracted nucleic acid preparations
- Final packaging of specimens for transport to diagnostic laboratories for additional testing (specimens should already be in a sealed, decontaminated primary container)
- Using inactivated specimens, such as specimens in nucleic acid extraction buffer
- Performing electron microscopic studies with glutaraldehyde-fixed grids

https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html

What tests can be done in a BSL 3 lab?

- Virus isolation in cell culture and initial characterization of viral agents recovered in cultures of SARS-CoV-2 specimens should only be conducted in a Biosafety Level 3 (BSL-3) laboratory using BSL-3 practices
- Site- and activity-specific biosafety risk assessments should be performed to determine if additional biosafety precautions are warranted based on situational needs

None of the laboratories should amplify the virus by culture or sequence of the virus from any positive sample.(Refer ICMR guidelines)

1. https://icmr.nic.in/sites/default/files/upload_documents/Addendum_ICMR_guideline_Private_Lab.pdf
2. https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html

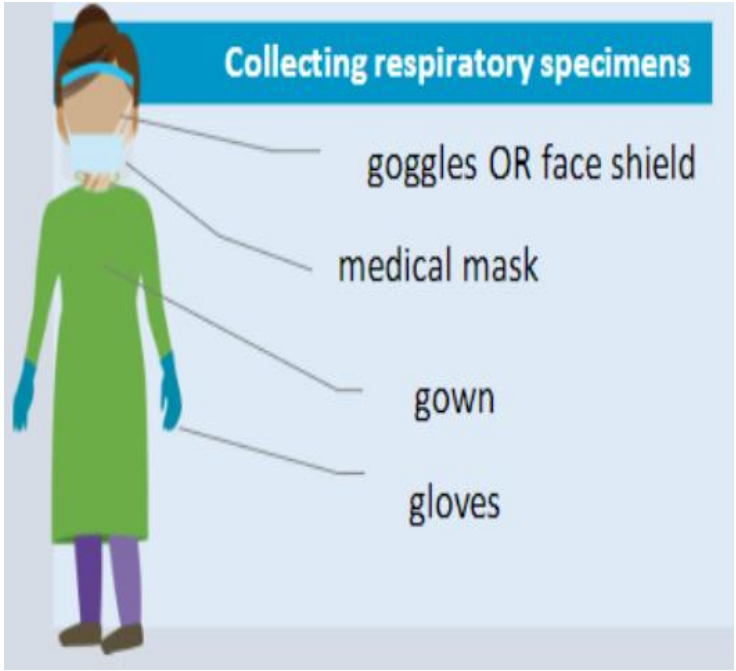
What PPE should the staff in the laboratory wear when handling respiratory specimens of COVID-19 patient?

- For procedures with a high likelihood to generate aerosols or droplets, use
  - certified Class II Biological Safety Cabinet (BSC) (or)
  - additional precautions to provide a barrier between the specimen and personnel to reduce the risk of exposure to laboratory personnel
    - e.g., PPE, such as a surgical mask or face shield, or
    - other physical barriers, like a splash shield
    - centrifuge safety cups and sealed centrifuge rotors etc
- Site & activity specific biosafety risk assessments should be performed to decide
  - if additional biosafety precautions warranted based on situational need such as
    - high testing volumes (or)
    - likelihood to generate infectious droplets and aerosols

1. Laboratory biosafety guidance related to the novel coronavirus (2019-nCoV). Geneva: World Health Organization; Interim guidance (12 February 2020)
2. COVID-19: safe handling and processing for samples in laboratories. Govt of UK. Updated 26 March 2020
3. https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html

What are the MoHFW guidance for managing a respiratory specimen from a COVID-19 patient?

- Consider all specimens as potentially Hazardous /Infectious
- Handle all specimens with gloves in a secure manner
- Place each specimen into a separate container labeled with
  - patient's name
  - identification number
  - the collection site
  - the date and time of the collection
- Do not contaminate outside of the specimen container
- Do not handle laboratory requisition forms with gloves
- BSL 2 containment level required to handle suspected samples



MoHFW, National ToT for COVID-19, March 06, 2020

What PPE should the staff in the labs be wearing when handling non respiratory samples?

- Follow standard precautions when handling clinical specimens, all of which may contain potentially infectious materials
- Respiratory protection is generally not a part of the core requirements
  - Local risk assessment should be conducted to determine whether the use of respiratory protection is needed
- Respiratory protective equipment such as masks or respirators are not necessary when respiratory tract, urine, fecal or tissue samples are handled inside a certified biosafety cabinet (BSC)

1.Laboratory biosafety guidance related to the novel coronavirus (2019-nCoV). Geneva: World Health Organization; Interim guidance (12 February 2020)
2. COVID-19: safe handling and processing for samples in laboratories. Govt of UK. Updated 26 March 2020
3. https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html

What are examples of AGPs in the laboratory?

Aerosol generating procedures in the laboratory include, but are not limited to:

- Pipetting
- Sonication
- Vortexing
- Centrifugation
- Preparation of smear
- Streak Inoculation of culture
- Preparation of smear
- Streak Inoculation of cultures
- Inserting hot loop into a culture

- **Aerosolization of amplicons (PCR products) during PCR amplification and handling**
  - Vigorous shaking of a tube containing liquid specimen or culture medium
  - Breakage of tube containing liquid specimen or culture
  - Opening of flip-open/rubber-stoppered tube containing a liquid specimen (especially when the cap of tube is soiled/wet with the sample)

1. Assessing Laboratory Risk Level and PEP: https://www.cdc.gov/brucellosis/laboratories/risk-level.html
2. https://www.who.int/malaria/areas/diagnosis/molecular-testing-dos-donts/en/

What precautions are needed in the lab when processing samples that generate aerosols?

- For procedures with a high likelihood to generate aerosols or droplets, use either a certified Class II Biological Safety Cabinet (BSC) or additional precautions to provide a barrier between the specimen and personnel
- Examples of these precautions include PPE, such as a surgical mask or face shield, or other physical barriers, like a splash shield; centrifuge safety cups; and sealed centrifuge rotors to reduce the risk of exposure to laboratory personnel
- Site- and activity-specific biosafety risk assessments should be performed to determine if additional biosafety precautions are warranted based on situational needs, such as high testing volumes, and the likelihood to generate infectious droplets and aerosols

https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html

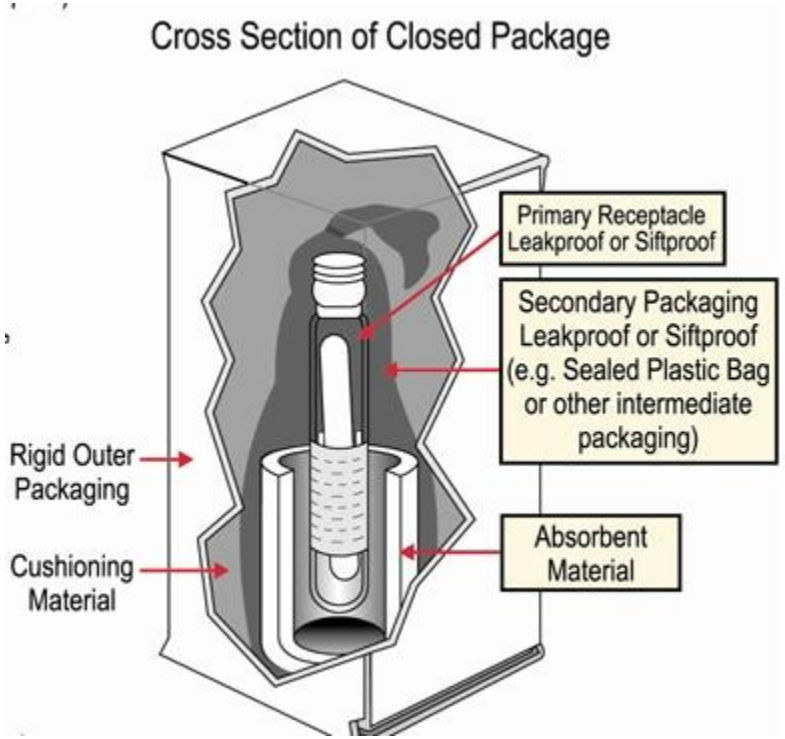
How can I minimize risk to staff in the laboratory?

- Personnel should adhere to standard procedures associated with other respiratory pathogens
- For procedures with a high likelihood to generate aerosols or droplets,
  - use either a certified Class II Type A1 or A2 BSC or additional precautions to provide a barrier between the specimen and personnel.
  - Examples of these additional precautions include personal protective equipment (PPE), such as a surgical mask or face shield, or other physical barriers, like a splash shield; centrifuge safety cups; and sealed centrifuge rotors to reduce the risk of exposure to laboratory personnel.
- Handle laboratory waste from testing suspected or confirmed COVID-19 patient specimens as all other biohazardous waste in the laboratory.
- Decontaminate work surfaces and equipment using hospital-grade disinfectants
- Standard protocols should be available for spill management

1. https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html
2. https://www.cdc.gov/coronavirus/2019-ncov/lab/guidelines-clinical-specimens.html

How can I minimize risk to lab staff outside the laboratory?

- Use **Standard Precautions** to provide a barrier between the specimen and personnel during specimen manipulation
- Handle laboratory waste from testing suspected or confirmed COVID-19 patient specimens as all other biohazardous waste in the laboratory
- If laboratory personnel have direct contact with suspected or confirmed COVID-19 patients follow recommended PPE for health care providers while in the presence of these patients
- No PPE is needed for lab staff when transporting triple packed samples



1. https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html
2. https://www.cdc.gov/coronavirus/2019-ncov/lab/guidelines-clinical-specimens.html
3. https://www.cdc.gov/smallpox/lab-personnel/specimen-collection/pack-transport.html

How should we transport non-respiratory specimens like blood from COVID patient?

- When handling and processing of specimens from cases with suspected or confirmed COVID-19 infection:
  - Follow good microbiological practices and procedures (GMPP)
  - Follow local guidelines for processing potentially infectious material.
  - Personnel should perform site- and activity-specific risk assessments to determine if enhanced biosafety precautions are warranted based on situational needs.

1. https://www.who.int/docs/default-source/coronaviruse/laboratory-biosafety-novel-coronavirus-version-1-1.pdf?sfvrsn=912a9847_2
2. https://www.cdc.gov/coronavirus/2019-ncov/lab/biosafety-faqs.html

How can aerosol producing lab procedures be minimized in the laboratory?

All technical procedures should be performed in a way that minimizes the aerosols and droplet generation

- All manipulations should be performed in appropriately maintained and validated BSCs or primary containment devices
- Laboratory personnel performing procedures must demonstrate capability
- **While centrifuging**
  - Use sealed safety cups and sealed rotors
  - Open cups inside a biosafety cabinet
  - Allow cups to sit prior to opening to allow aerosols to settle if no biosafety cabinet available
  - Use “to deliver” pipettes to avoid blowing out the last drop
- Use a laboratory blender with a tight-fitting gasketed lid and leak-proof bearings (domestic kitchen blenders leak and release aerosols)
- Use a cooled loop for insertion into a culture
- **While opening tubes**
  - Avoid using tubes with push-in closures (when opened, the film of liquid trapped between tube and closure breaks and releases aerosols)

https://www.who.int/publications-detail/laboratory-biosafety-guidance-related-to-coronavirus-disease-2019-(covid-19)

Environmental cleaning and laundry

Should environmental cleaning practices differ in areas where COVID-19 patients are not admitted?

Table 3. Health-care setting: Recommended frequency of cleaning of environmental surfaces, according to the patient areas with suspected or confirmed COVID-19 patients.

Patient area	Frequency [a]	Additional guidance
Screening/triage area	At least twice daily	• Focus on high-touch surfaces, then floors (last)
Inpatient rooms / cohort – occupied	At least twice daily, preferably three times daily, in particular for high-touch surfaces	• Focus on high-touch surfaces, starting with shared/common surfaces, then move to each patient bed; use new cloth for each bed if possible; then floors (last)
Inpatient rooms – unoccupied (terminal cleaning)	Upon discharge/transfer	• Low-touch surfaces, high-touch surfaces, floors (in that order); waste and linens removed, bed thoroughly cleaned and disinfected
Outpatient / ambulatory care rooms	After each patient visit (in particular for high-touch surfaces) and at least once daily terminal clean	• High-touch surfaces to be disinfected after each patient visit • Once daily low-touch surfaces, high-touch surfaces, floors (in that order); waste and linens removed, examination bed thoroughly cleaned and disinfected
Hallways / corridors	At least twice daily [b]	• High-touch surfaces including railings and equipment in hallways, then floors (last)
Patient bathrooms/ toilets	Private patient room toilet: at least twice daily Shared toilets: at least three times daily	• High-touch surfaces, including door handles, light switches, counters, faucets, then sink bowls, then toilets and finally floor (in that order) • Avoid sharing toilets between staff and patients

[a] Environmental surfaces should also be cleaned and disinfected whenever visibly soiled or if contaminated by a body fluid (e.g., blood); [b] Frequency can be once a day if hallways are not frequently used.

https://www.who.int/publications-detail/cleaning-and-disinfection-of-environmental-surfaces-inthe-context-of-covid-19

Is fogging recommended as part of terminal disinfection of COVID patient rooms?

Fogging is no longer recommended

- Evidence from studies in the 1970's showed:
  - Fogging lacked microbicidal efficacy
    - e.g., use of quaternary ammonium compounds in mist applications
  - Had adverse effects on healthcare workers and others in the facility
    - Any individual coming into contact with fogging operations without full PPE may be at risk for adverse effects
  - NCDC and CDC Guidelines do not recommend it based on the evidence
- These recommendations do not apply to newer technologies involving fogging for room decontamination (e.g., ozone mists, vaporized hydrogen peroxide)
  - Additional research is needed to clarify the efficacy of these methods

1. https://www.mohfw.gov.in/pdf//National%20Guidelines%20for%20IPC%20in%20HCF%20-%20final%281%29.pdf
2. https://www.cdc.gov/hai/prevent/resource-limited/environmental-cleaning.html

Is fogging with disinfectants recommended for public spaces and terminal disinfection of patient rooms?

Public places

- The potential efficacy of **large-scale fogging applications in outdoor environments has not been established**, with rapid dispersion leading to high likelihood of incomplete coverage and inadequate levels of application to enable contact times to be adhered to
- cleaning and disinfection methods should focus on surfaces that are frequently hand-touched and utilize manual application.
- Any disinfectant, including those used within newer technologies, may have adverse effects to the respiratory system if inhaled, therefore full personal protective equipment to protect the mouth, nose and eyes would be required for personnel involved in these operations
- Importantly, the efficacy of new technologies using EPA-registered chemicals for fogging applications has only been established in indoor, enclosed environments

1. *https://www.mohfw.gov.in/pdf/AdvisoryagainstsprayingofdisinfectantonpeopleforCOVID19managementFinal.pdf*
2. *https://www.mohfw.gov.in/pdf//National%20Guidelines%20for%20IPC%20in%20HCF%20-%20final%281%29.pdf*
3. *https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html*

Can electrolyzed water be used as a fogging agent for ICU's?

- Evidence is unclear
- Electrolyzed water is used in the food industry as a disinfectant /sanitizer
  - Has some promising results and characteristics
  - Use of hypochlorous acid generated from the electrolysis is less corrosive than chlorine.
  - At this time seems experimental with weak evidence base. Regulatory testing needed so it can be used according to manufacturer's instructions.
  - It is not validated in the US.
- Without additional evidence can not advise on how to use (i.e. what concentration required for application)

1. ***https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2723303/***
2. ***https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1932820/***
3. ***https://www.cdc.gov/infectioncontrol/pdf/guidelines/disinfection-guidelines-H.pdf***

How should we handle and transport COVID-19 laundry?

- Staff handling soiled bedding, towels and clothes from COVID-19 positive patients should wear appropriate PPE before touching it
  - heavy duty gloves, mask, eye protection (goggles or face shield), long-sleeved gown, an apron if the gown is not fluid resistant, boots or closed shoes
- Staff should perform hand hygiene after exposure to blood or body fluids and after removing PPE
- Soiled linen should be placed in clearly labelled, leak-proof bags or containers, after carefully removing any solid excrement and putting it in a covered bucket to be disposed of in a toilet or latrine

1. https://apps.who.int/iris/rest/bitstreams/1271257/retrieve
2. https://www.who.int/news-room/q-a-detail/q-a-on-infection-prevention-and-control-for-health-care-workers-caring-for-patients-with-suspected-or-confirmed-2019-ncov

Are there SOPs to be followed by hospitals for cleaning?

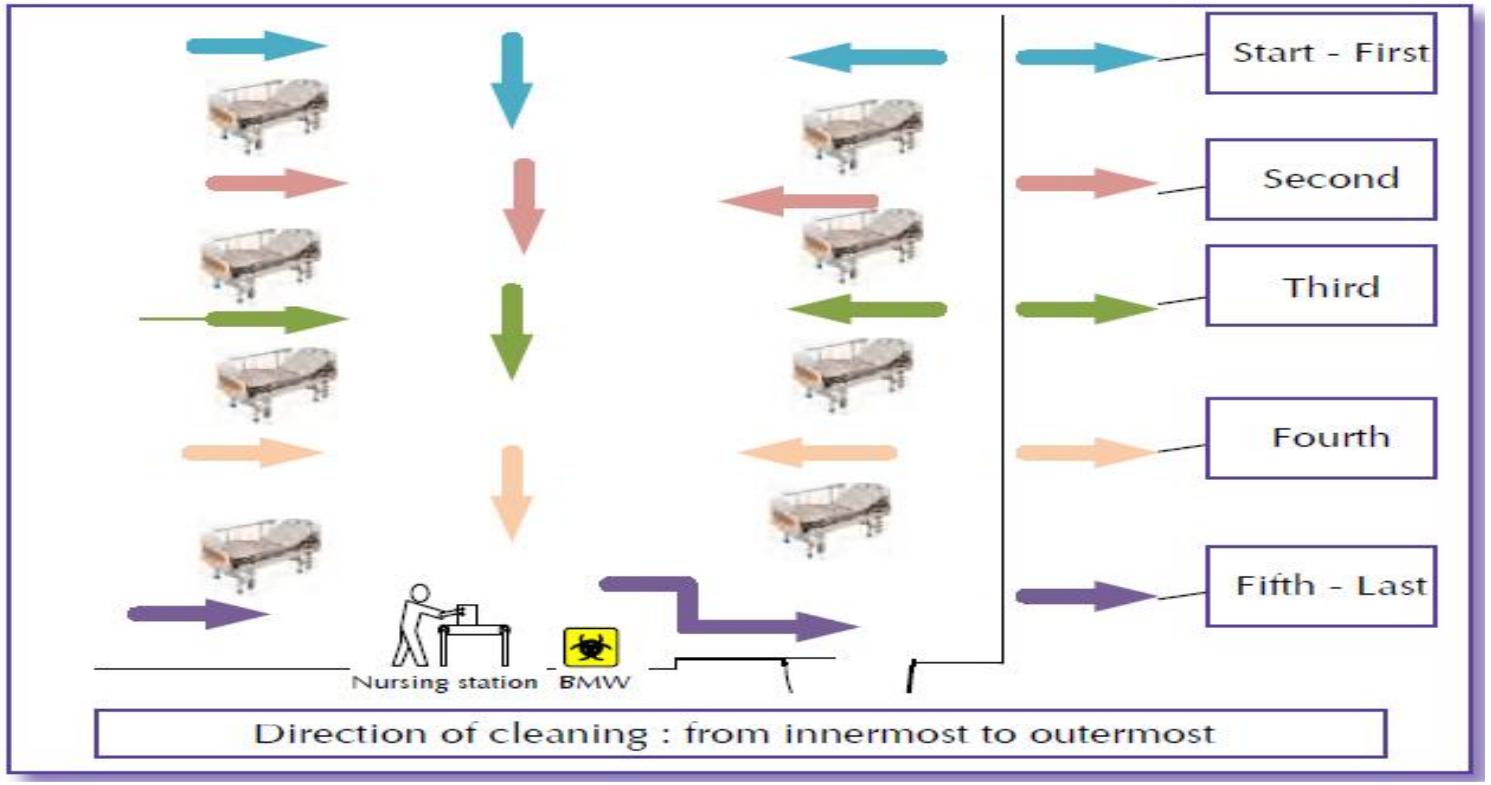
Hospitals need to ensure that they follow standard methods of cleaning for different areas of the hospital. General recommendations include :

- Use of three bucket system of cleaning
- Use of outward mopping. The direction of cleaning in health facilities should be from clean to the dirty area. In closed spaces like a ward the direction should be from within outwards
- Use of brooms in the patient care area should be avoided
- There should be separate mops for critical and general areas. The mops should not be shared between the critical and general areas
- Disinfection and washing of mops is required after each cleaning cycle
- Considerations to maintain healthcare delivery as number of COVID-19 cases increase

Guidelines for Environmental Infection Control in Health-Care Facilities, Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC) ,U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC) Atlanta, GA 30329,2003,Updated: July 2019 https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html

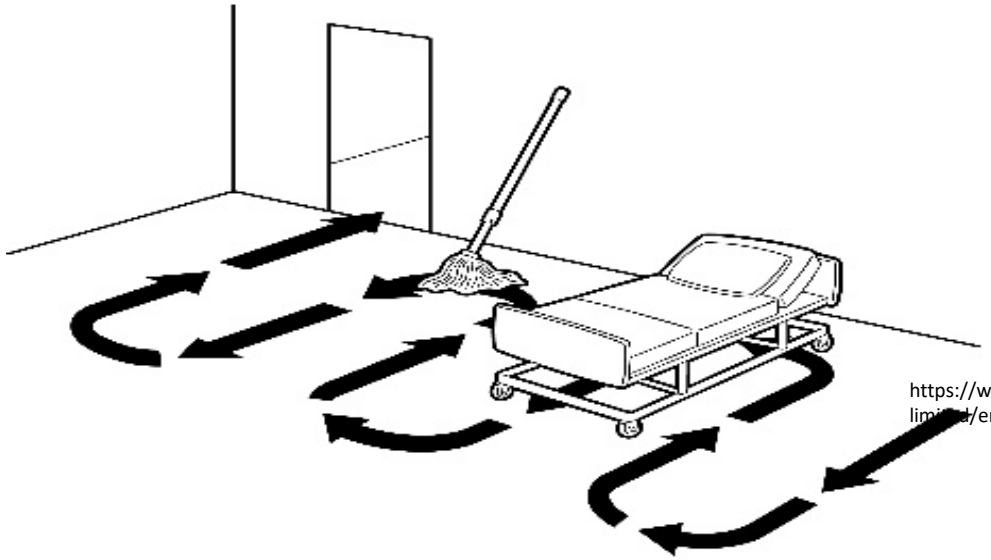
Is there a recommended direction/flow in which cleaning should occur? (1/2)

Standard operating procedures for cleaning methods of different areas of hospital



https://nhm.gov.in/images/pdf/in-focus/Implementation_Guidebook_for_Kayakalp.pdf

Is there a recommended direction/flow in which cleaning should occur? (2/2)



https://www.cdc.gov/hai/prevent/resource-limited/environmental-cleaning.html

Example of mopping strategy, working toward the exit

Example of cleaning strategy from cleaner to dirtier

https://www.cdc.gov/hai/prevent/resource-limited/environmental-cleaning.html /.

Is disinfecting a surface the same as cleaning a surface?

- Disinfectants are only to be used after cleaning and are not substitutes for cleaning, unless they are a combined detergent-disinfectant product.
- Cleaning is the necessary first step of any sterilization or disinfection process.
- Cleaning renders the environmental surface safe to handle or use by removing organic matter, salts, and visible soils, all of which interfere with microbial inactivation.
- The physical action of scrubbing with detergents and surfactants and rinsing with water removes large numbers of microorganisms from surfaces. If the surface is not cleaned before the terminal reprocessing procedures are started, the success of the sterilization or disinfection process is compromised.

Guidelines for Environmental Infection Control in Health-Care Facilities, Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC) ,U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC) Atlanta, GA 30329,2003,Updated: July 2019 https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html

What PPE considerations should be in place for cleaning staff?

Use of PPE for all environmental cleaning procedures is recommended. The best practices for PPE for cleaning staff include:

- Always perform hand hygiene directly before wearing gloves and directly after removal
- Put on all required PPE before entering a patient care area and remove it before leaving the area
  - Exception: do not take off PPE in an airborne precaution area where a respirator (e.g.N95) is required, until after leaving the isolation area
- Include required PPE for specific tasks in SOPs and other visual job aids (e.g. signage for isolation areas, preparation of solutions)
- **Use Safety data sheets** (SDS) to determine required PPE for preparing environmental cleaning products and solutions (e.g. manual dilutions)
- All PPE (reusable and disposable) should be in good supply, well maintained, cleaned before use and in good repair
- Reprocess (clean and disinfect) all reusable PPE at least once a day
- Use reusable rubber gloves for cleaning
- Use chemical-resistant gloves (e.g. nitrile, latex) for preparation of cleaning chemicals

1. *Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC) ,U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC) Atlanta, GA 30329,2003,Updated: July 2019 https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html*
2. *https://www.mohfw.gov.in/pdf/AdditionalguidelinesonrationaluseofPersonalProtectiveEquipmentsettingapproachforHealthfunctionariesworkinginnonCOVIDareas.pdf*

Are environmental cleaning procedures different for COVID-19 and non-COVID Inpatient wards?

- Follow routine cleaning and disinfecting procedures for all
- Frequency of cleaning has to be increased based on transmission risk

Are there separate cleaning guidelines for patients in isolation rooms?

There are published guidelines regarding cleaning strategies for isolation areas and operating rooms

The basic strategies for areas housing immunosuppressed patients include:

- Wet dusting horizontal surfaces daily with cleaning cloths pre-moistened with detergent or hospital disinfectant or disinfectant wipes
- Using care when wet dusting equipment and surfaces above the patient to avoid patient contact with the detergent/disinfectant
- Avoiding the use of cleaning equipment that produces mists or aerosols
- Equipping vacuums with HEPA filters, especially for the exhaust, when used in any patient-care area housing immunosuppressed patients
- Regular cleaning and maintenance of equipment to ensure efficient particle removal

https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html

Are there specific procedures to clean spills of blood or body fluids off a ward or isolation room floor?

- It is important to clean and disinfect areas immediately after any spills of blood or body fluids
- General steps for cleaning of spills of blood or body fluids:
  - Wear appropriate PPE
  - Confine the spill and wipe it up immediately with absorbent (paper) towels, cloths, or absorbent granules (if available) that are spread over the spill to solidify the blood or body fluid (all should then be disposed as infectious waste)
  - Clean thoroughly, using neutral detergent and warm water solution
  - Disinfect, using a facility-approved intermediate-level disinfectant
  - Typically, chlorine-based disinfectants at 1:100 or 1:10 dilution of 10% chlorine-bleach; depending on the size of the spill are adequate for disinfecting spills (however, do not use chlorine-based disinfectants on urine spills)[2]
  - Take care to allow the disinfectant to remain wet on the surface for the required contact time (e.g., 10 minutes), and then rinse the area with clean water to remove the disinfectant residue
  - Immediately send all reusable supplies and equipment (e.g., cleaning cloths, mops) for reprocessing (i.e., cleaning and disinfection) after the spill is cleaned up

1. ***https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html***
2. ***National Biomedical waste management regulations 2016 and Amendments 2018 & 2019***

How can we monitor environmental cleaning

CDC Environmental Checklist for Monitoring Terminal Cleaning[1]

Date:	
Unit:	
Room Number:	
Initials of ES staff (optional):[2]	

Evaluate the following priority sites for each patient room:

High-touch Room Surfaces[3]	**Cleaned**	**Not Cleaned**	**Not Present in Room**
Bed rails / controls			
Tray table			
IV pole (grab area)			
Call box / button			
Telephone			
Bedside table handle			
Chair			
Room sink			
Room light switch			
Room inner door knob			
Bathroom inner door knob / plate			
Bathroom light switch			
Bathroom handrails by toilet			
Bathroom sink			
Toilet seat			
Toilet flush handle			
Toilet bedpan cleaner			

Evaluate the following additional sites if these equipment are present in the room:

High-touch Room Surfaces[3]	**Cleaned**	**Not Cleaned**	**Not Present in Room**
IV pump control			
Multi-module monitor controls			
Multi-module monitor touch screen			
Multi-module monitor cables			
Ventilator control panel			

https://www.cdc.gov/hai/toolkits/evaluating-environmental-cleaning.html

What is the disinfectant's dwell time against SARS-CoV-2 for different surfaces?

- Common disinfectants – Contact time of a minimum of 1 minute or as recommended by the manufacturers
  - Ethanol 70-90%
  - Chlorine-based products (e.g., hypochlorite) at 0.1% (1000 ppm) for general environmental disinfection
  - Hydrogen peroxide >0.5%
- Other disinfectants can be considered, provided the manufacturers recommend them for the targeted microorganisms, especially enveloped viruses. Manufacturers' recommendations for safe use as well as for avoiding mixing types of chemical disinfectants should always be considered when preparing, diluting or applying a disinfectant.
- Please note that due to the novel nature of COVID 19, it may not be listed on product labels at this time

1. ***https://www.who.int/publications-detail/cleaning-and-disinfection-of-environmental-surfaces-inthe-context-of-covid-19***
2. ***https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html***

What equipments cleaning staff require for cleaning?

- It is preferable to have three-bucket trolleys with a wringing mechanism.
- The trolley should have provision to store bottles of disinfectant and hand and stick mops on the trolley.
- A separate storage space for used hand mops should be available on the trolley.
- It is important to ensure that the trolley/bucket is clean before using it. While mopping, utilizing the Three-bucket system is ideal.
  - First bucket contains water with detergent and is used in the beginning
  - Second bucket contains water in which the mop is rinsed.
  - The mop is then dipped in the third bucket that contains a disinfectant and the mopping is done again

Guidelines for Implementation of "Kayakalp" initiative, Ministry of Health and Family Welfare, Government of India
https://nhm.gov.in/images/pdf/in-focus/Implementation_Guidebook_for_Kayakalp.pdf

What disinfectants can be used on smart phones?

- An alcohol wipe with 70% isopropyl or Clorox disinfecting wipes can be used by gently wiping the exterior surfaces of smart phone
- Care should be taken to avoid bleach, compressed air and other cleaning products

1. ***https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html***
2. ***https://time.com/5804610/phone-clean-wipes/***
3. ***https://support.apple.com/en-us/HT207123***

How do you launder clothes worn by healthcare providers working in ICU/isolation rooms that are treating COVID patients?

- For commercial laundry machines:
  - Follow instructions from the washer/dryer manufacturer.
  - Use hot water (60–90°C X 10 min) [158–176°F]) and an approved laundry detergent.
  - Dry linens completely in a commercial dryer.

- For manual laundering:
  - Clean by immersing in detergent and hot water solution and use mechanical action (scrubbing) to remove soil.
  - Soak in a 0.05% chlorine solution for approximately 30 minutes after cleaning with detergent and water.
  - Rinse with clean water to remove residue.
  - Allow to fully dry, ideally in the sun.

https://www.who.int/news-room/q-a-detail/q-a-on-infection-prevention-and-control-for-health-care-workers-caring-for-patients-with-suspected-or-confirmed-2019-ncov

Healthcare worker safety

What case definition should we follow?

Facilities should use the most recent case definitions established by MoHFW

(may change depending on epidemiologic situation)

1. Case definition

When to suspect

- All symptomatic individuals who have undertaken international travel in the last 14 days

or

- All symptomatic contacts of laboratory confirmed cases

or

- All symptomatic healthcare personnel (HCP)

or

- All hospitalized patients with severe acute respiratory illness (SARI) (fever AND cough and/or shortness of breath)

or

- Asymptomatic direct and high risk contacts of a confirmed case (should be tested once between day 5 and day 14 after contact)

Symptomatic refers to fever/cough/shortness of breath.

Direct and high-risk contacts include those who live in the same household with a confirmed case and HCP who examined a confirmed case.

Confirmed case

A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms

https://www.mohfw.gov.in/pdf/RevisedNationalClinicalManagementGuidelineforCOVID1931032020.pdf as viewed on 16 April 2020

If staff fall ill, how should this be handled?

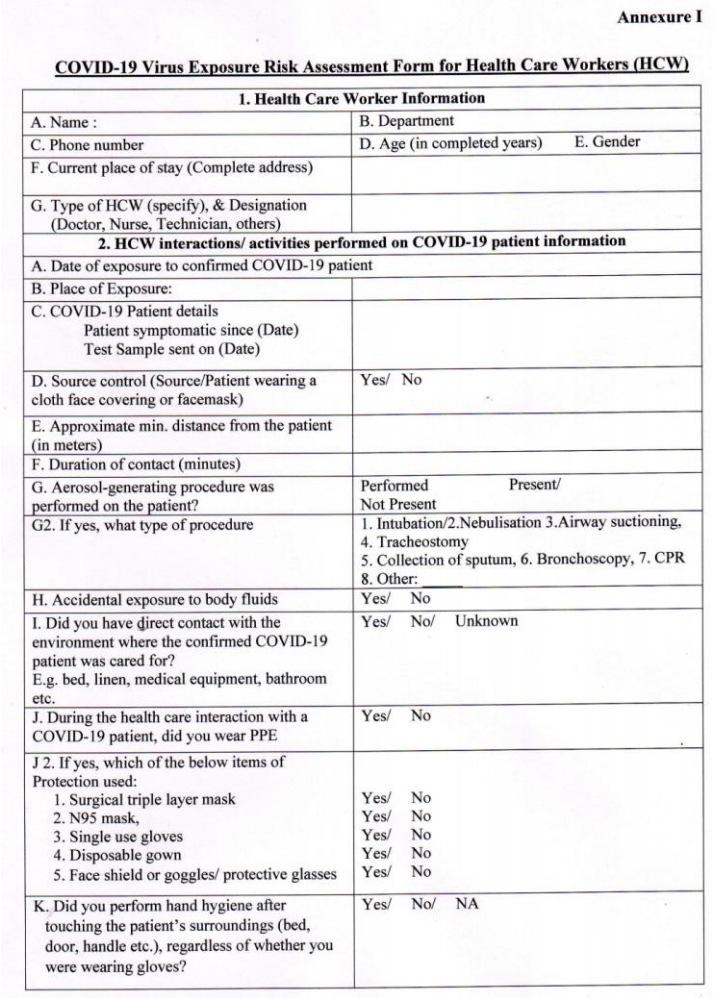
- If HCW are sick, they should follow protocols for symptomatic HCW and undergo COVID-19 testing
- Monitoring and managing exposed healthcare workers:
  - Facilities and organizations providing healthcare should implement sick leave policies for HCW that are non-punitive, flexible, and consistent with public health guidance
  - Movement and monitoring decisions for HCW with exposure to COVID-19 should be made in consultation with public health authorities
- Follow MoHFW guidance released on 16 May, 2020 or latest version.

https://www.mohfw.gov.in/pdf/AdvisoryformanagingHealthcareworkersworkinginCOVIDandNonCOVIDareasofthehospital.pdf
https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assesment-hcp.html

What is the guidelines for HCW who have contact with positive case?

- **High risk exposure:**
  - HCW or other person providing care to a COVID-19 case or lab worker handling respiratory specimens from COVID-19 cases without recommended PPE or with possible breach of PPE
  - Performed aerosol generating procedures without appropriate PPE.
  - HCWs without mask/face-shield/goggles:
    - having face to face contact with COVID-19 case within 1 metre for more than 15 minutes o having accidental exposure to body fluids
- **Low risk exposure**: Contacts who do not meet criteria of high risk exposure

- High risk contacts will be quarantined for 14 days, tested as per ICMR testing protocol, actively monitored for development of symptoms and managed as per laid down protocol
  - If they test positive but remain asymptomatic they will follow protocol for very mild/mild/presymptomatic cases
  - If they test negative and remain asymptomatic, complete 14 day quarantine and return to work
  - Low risk contacts shall continue to work. They will self-monitor their health for development of symptoms. In case symptoms develop



Annexure I

COVID-19 Virus Exposure Risk Assessment Form for Health Care Workers (HCW)

1. Health Care Worker Information	
A. Name :	B. Department
C. Phone number	D. Age (in completed years) E. Gender
F. Current place of stay (Complete address)	
G. Type of HCW (specify), & Designation (Doctor, Nurse, Technician, others)	
2. HCW interactions/ activities performed on COVID-19 patient information	
A. Date of exposure to confirmed COVID-19 patient	
B. Place of Exposure:	
C. COVID-19 Patient details Patient symptomatic since (Date) Test Sample sent on (Date)	
D. Source control (Source/Patient wearing a cloth face covering or facemask)	Yes/ No
E. Approximate min. distance from the patient (in meters)	
F. Duration of contact (minutes)	
G. Aerosol-generating procedure was performed on the patient?	Performed Present/ Not Present
G2. If yes, what type of procedure	1. Intubation/2.Nebulisation 3.Airway suctioning, 4. Tracheostomy 5. Collection of sputum, 6. Bronchoscopy, 7. CPR 8. Other:
H. Accidental exposure to body fluids	Yes/ No
I. Did you have direct contact with the environment where the confirmed COVID-19 patient was cared for? E.g. bed, linen, medical equipment, bathroom etc.	Yes/ No/ Unknown
J. During the health care interaction with a COVID-19 patient, did you wear PPE	Yes/ No
J 2. If yes, which of the below items of Protection used: 1. Surgical triple layer mask 2. N95 mask, 3. Single use gloves 4. Disposable gown 5. Face shield or goggles/ protective glasses	 Yes/ No Yes/ No Yes/ No Yes/ No Yes/ No
K. Did you perform hand hygiene after touching the patient's surroundings (bed, door, handle etc.), regardless of whether you were wearing gloves?	Yes/ No/ NA

https://www.mohfw.gov.in/pdf/AdvisoryformanagingHealthcareworkersworkinginCOVIDandNonCOVIDareasofthehospital.pdf

How should hospitals plan for manpower issues if HCWs are not able to work?

Few examples contributed by different hospitals:

- Division of hospital staff
  - Hospital divided manpower in half, each with 7 day shifts to minimize exposure
  - Divided staff in high exposure area into 3 teams with each team working a 7-day shift and then having two weeks off
- Shift management
  - 12 hour shifts instead of 8 hour shifts for staff
- Special leave to immunosuppressed / those with comorbidities to work from home
- Shifted OPD staff to the hospital

How can individual departments be involved in staffing decisions?

- Healthcare facilities should be planning for surge capacity to double or triple their staff
- Staff normally engaged in non-COVID activities (e.g. non-communicable disease or elective surgeries) can be re-assigned to expand capacity in a surge scenario with adequate supervision
- Determine a process for expedited credentialing of supplemental staff and for the orientation/mentoring of supplemental or shared staff
- Develop demand staffing plans for all categories of staff
- Modify staff responsibilities and shifts as required

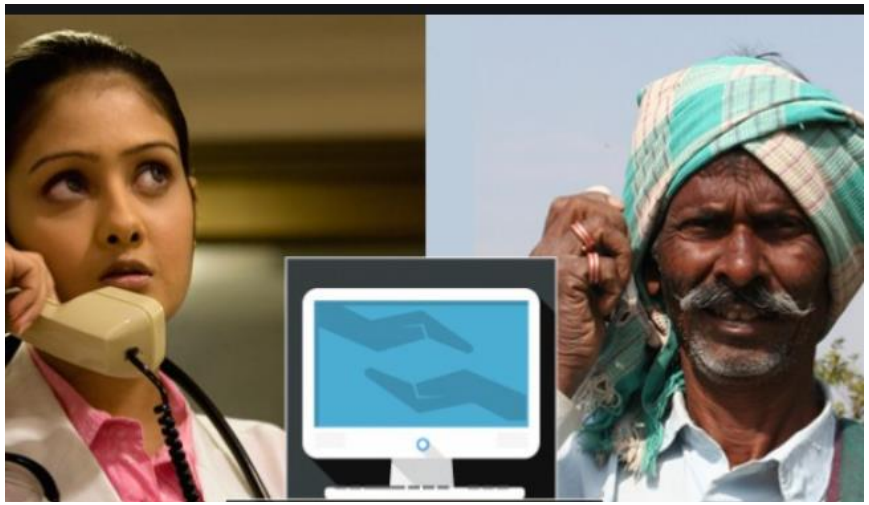
https://www.phe.gov/Preparedness/COVID19/Documents/COVID-19%20Healthcare%20Planning%20Checklist.pdf

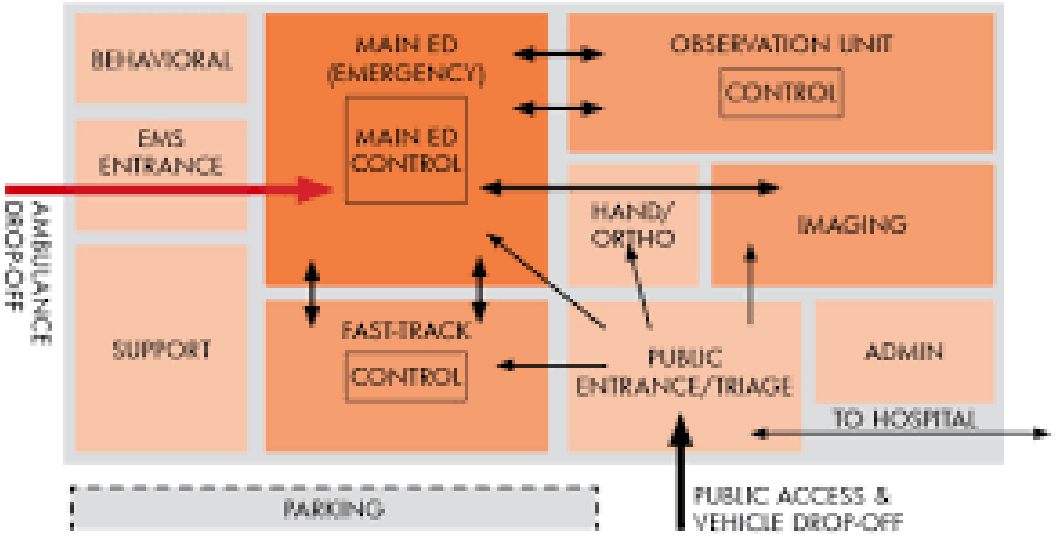
How can we protect our employees' health? (1 of 3)

Three main ways to protect health care workers from getting COVID-19:

1. Limit infection entering your facility

- Cancel elective procedures
- Use telemedicine when possible
- Limit points of entry and manage visitors
- Screen patients for respiratory symptoms
- Encourage patient respiratory hygiene using alternatives to facemasks (e.g., tissues to cover cough)





https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html

How can we protect our employees' health? (2 of 3)

2. **Isolate symptomatic patients as soon as possible**
   - Set up separate, well-ventilated triage areas
   - Place patients with suspected or confirmed COVID-19 in private rooms with door closed and private bathroom (as possible)
   - If available, prioritize AIIRs for patients undergoing aerosol-generating procedures

https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html

How can we protect our employees' health? (3 of 3)

3. **Protect healthcare personnel**
   - Emphasize hand hygiene
   - Install barriers to limit contact with patients at triage
   - Cohort COVID-19 patients
   - Limit the numbers of staff providing their care
   - Cohort staff working in isolation wards
   - Prioritize respirators and AIIRs for aerosol-generating procedures, and implement PPE optimization strategies to extend supplies.

https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html

How to ensure surgeons / staff are safe when doing surgery?

- Elective surgeries should be postponed
- Standard infection control practices should be in place
- Take precautions when performing Aerosol-Generating Procedures (AGPs)
- Operating rooms should be allocated and signs posted on the doors to minimize staff exposure
- **If no general anesthesia:**
  - The patient should continue to wear the surgical mask
- **If general anesthesia used:**
  - Place a HEPA filter between the Y-piece of the breathing circuit and the patient's mask, endotracheal tube or laryngeal mask airway
  - If available, use a closed suction system during airway suctioning

1. https://journals.lww.com/annalsofsurgery/Documents/Managing%20COVID%20in%20Surgical%20Systems%20v2.pdf
2. https://www.asahq.org/about-asa/governance-and-committees/asa-committees/committee-on-occupational-health/coronavirus
3. https://doi.org/10.1007/s12630-020-01617-4

When should the hospital staff start using PPE as standard care?

- **Health care facilities should ALWAYS adhere to Standard and Transmission-Based Precautions**
- **It should be assumed that every person is potentially infected or colonized**, not necessarily with COVID-19, with a pathogen that could be transmitted in the healthcare setting
- Attention should be paid to training and proper donning (putting on), doffing (taking off), and disposal of any PPE

https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html

Surgical Procedures and COVID -19

How do I prepare my operating room for surgical procedures of suspected or confirmed COVID-19 patients?

- Dedicate an operating room (OR) and empty all nonessential materials
- Transmission based precaution; PPE made available for all OR staff
- Create separate negative pressure area for donning and doffing
- Dedicated equipment and medication cart in OR
- If patient to be intubated
  - Done in negative pressure room prior to OR
  - avoid intubation in OR
- Place high-quality viral filters between
  - breathing circuit and the patient's airway
  - expiratory limb and the machine

https://www.facs.org/covid-19/clinical-guidance/resuming-elective-surgery - Accessed on 17 April 2020

Elective Surgery Acuity Scale (ESAS) for assisting in Triage

- Before planning for surgery consider:
  - Patients' medical needs
  - Logistical capability to meet needs in real time
- Assess the real risk of:
  - Proceeding with surgery
  - Short term delay
  - Long term delay of 6-8 weeks or more
- American College of Surgeons (ACS) suggests that surgeons look at the Elective Surgery Acuity Scale (ESAS) from St. Louis University

Tiers/Description	Definition	Locations	Examples	Action
Tier 1a	**Low acuity surgery/healthy patient** Outpatient surgery Not life threatening illness	HOPD ASC Hospital with low/no COVID- 9 census	Carpal tunnel release Penile prosthesis EGD Colonoscopy	Postpone surgery or perform at ASC
Tier 1b	**Low acuity surgery/unhealthy patient**	HOPD ASC Hospital with low/no COVID-19 census		Postpone surgery or perform at ASC
Tier 2a	**Intermediate acuity surgery/healthy patient** Not life threatening but potential for future morbidity and mortality. Requires in hospital stay	HOPD ASC Hospital with low/no COVID-19 census	Low risk cancer Non urgent spine Ureteral colic	Postpone surgery if possible or consider ASC
Tier 2b	**Intermediate acuity surgery/unhealthy patient**	HOPD ASC Hospital with low/no COVID-19 census		Postpone surgery if possible or consider ASC
Tier 3a	**High acuity surgery/healthy patient**	Hospital	Most cancers Highly symptomatic patients	Do not postpone
Tier 3b	**High acuity surgery/unhealthy patient**	Hospital		Do not postpone

Hospital Outpatient Department (HOPD), Ambulatory Surgery Center (ASC)

https://www.facs.org/covid-19/clinical-guidance/triage

What are the COVID PPE for Surgeons

- Standard surgical personal protective equipment (PPE) includes
  - a face shield
  - Mask
  - **N 95 (When an AGP is performed)**
  - waterproof gown
  - double gloves, and shoe covers

- Aerosols have been identified from multiple surgical procedures, including those that use electrocautery and high-speed tools, and smoke from electrocautery has been shown to harbor intact bacterial and virus particles

- **Surgery can be considered a form of "aerosol generating procedure" (AGP), especially with the use of electrocautery and/or laparoscopy or if done under general anesthesia**

https://journals.lww.com/annalsofsurgery/Documents/COVID%20Surgery_VF.pdf

What are the aerosol generating procedures (AGP) in OR?

- AGP procedures related to operating rooms include
  - Intubation
  - Extubation
  - Bag masking
  - Bronchoscopy
  - Chest tubes
  - Electrocautery of blood, gastrointestinal tissue, any body fluids
  - Laparoscopy/endoscopy

- **There are insufficient data to recommend for/against an open versus laparoscopy approach; however, the surgical team should choose an approach that minimizes OR time and maximizes safety for both patients and healthcare staff.**

COVID-19 Guidelines for Triage of Emergency General Surgery Patients
https://www.facs.org/covid-19/clinical-guidance/elective-case/emergency-surgery Accessed on 25 March 2020

What are the considerations for optimum protection of surgeons

- Use of Personal Protective Equipment (in the operating room)
- **Appropriate donning/doffing of the PPE)**
- Intubation Risks
- Specific Operative Risk Issues
- After Operation/Recovery (leaving the OR and the facility)
- Going Home—What Should Be Done to Keep Your Family Safe

https://www.facs.org/covid-19/clinical-guidance/surgeon-protection

HOW TO PUT ON AND TAKE OFF

Personal Protective Equipment (PPE)

World Health Organization

How to put on PPE (when all PPE items are needed)

Step 1

- Identify hazards & manage risk. Gather the necessary PPE.
- Plan where to put on & take off PPE.
- Do you have a buddy? Mirror?
- Do you know how you will deal with waste?

Step 2

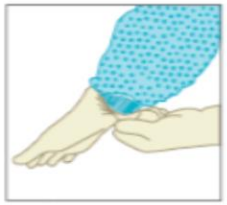
- Put on a gown.

Step 3 - Put on medical mask and eye protection (e.g. face shield, eye visor/goggles)

+

or

Note: If performing an aerosol-generating procedure (e.g. aspiration of respiratory tract, intubation, resuscitation, bronchoscopy, autopsy), a particulate respirator (e.g. US NIOSH-certified N95, EU FFP2, or equivalent respirator) should be used in combination with a face shield or an eye protection. Do user seal check if using a particulate respirator.



Step 4

- Put on gloves (over cuff).

How to take off PPE

Step 1

- Avoid contamination of self, others & the environment
- Remove the most heavily contaminated items first

Remove gloves & gown

- Peel off gown & gloves and roll inside, out
- Dispose gloves and gown safely

Step 2

- Perform hand hygiene

Step 3a

If wearing face shield:

- Remove face shield from behind
- Dispose of face shield safely

Step 3b

If wearing eye protection and mask:

- Remove goggles from behind
- Put goggles in a separate container for reprocessing
- Remove mask from behind and dispose of safely

Step 4

- Perform hand hygiene

Going Home after Hospital Duty: What Should Be Done to Keep Your Family Safe

Do not bring coronavirus home from workplace

- Minimizing personal exposure at work
- **No wallet** – Bring only driving license + bank card in plastic zip loc bag
- **No protective case for phones** to allow for wiping down with isopropyl alcohol wipes
  - Phone remains in pocket or bag, not to be placed on work surfaces.
  - Preferably in bag
  - Leave on loud volume
  - Consider keeping in Ziplock bag
- **Dedicated minimal list work clothes** – T-Shirt, pants, no belt, no jewellery, cheap shoes, leave outside the house
- Take lunch to work in reusable shopping bag to hot wash with clothes on return home
  - Avoid lunches from outside
  - Bring drinking bottle of water to avoid water coolers and kitchens

In the healthcare facility while on duty

- Kick doors open where possible, use the gel at each door
- No cloth surgical cap, disposable only. Don't touch face ever. Forget lanyards.
- Non COVID cases – REMEMBER only 0-36% of infected will have symptoms
- Before going home from hospital
  - Thorough hand and arm wash.
  - Hand and arm alcohol gel, leave pen in locker.
  - Alcohol gel in car to clean hands
- **Pen for writing case sheets – Remains in locker at hospital,** frequently coat with alcohol gel
  - Consider disposable pens
- If worked in Triage/ isolation facility / cared for COVID -19 patient the healthcare worker should take a shower after doffing if facility available in the hospital

After going home,
What should be done to keep your family safe?

- Shoes off outside
- **No hugs**
- Clothes off at front door
- Immediate shower
- Keep cloths inside separate laundry bag
- Hot wash work clothes and reusable shopping bad.
- Dryer afterwards

How can HCWs protect their families from COVID-19? (1 of 2)

- When finishing a shift taking care of COVID-19 patients:
  - Remove all PPE in anteroom
  - Remove all the PPE (gloves, gown, face shield or goggles, N-95) in the dedicated doffing area as per the checklist
  - After finishing the doffing process completely, the healthcare worker should leave the doffing area and directly go to the designated shower area
  - In the shower area, the healthcare workers should remove all scrubs and take shower with soap and water
- Perform regular hand hygiene during and after all shifts and before leaving the facility

How can HCWs protect their families from COVID-19? (2 of 2)

- Healthcare institutions and systems may make hotel accommodations available for healthcare workers who **cannot or prefer not to go home** following patient care activities.
- Keep **hand sanitizer and/or disposable gloves** for use of ATM, vending machines, and transfer of items at the time of purchases.
- Clean your **mobile phone** frequently before, during, and after patient care activities. Phones may be kept in a resealable (Ziploc) plastic bag during work activities and can be used while in the bag.
- Consider removing clothes and washing them **upon arrival home**.
- Consider reducing physical contact with family members and **wash hands frequently**.
- Clean hard surfaces at home with an **effective disinfectant solution** (e.g. 60% alcohol).

https://www.facs.org/covid-19/clinical-guidance/surgeon-protection

What are the PPE recommendations for Surgeons

3/30/2020

PPE Recommendations *Updated 3/30/2020*

Patient Care for Patients Not Suspected for COVID-19	Patient Care for Patients Suspected or Positive for COVID-19 *If interaction requires being within 3 feet of the patient, the patient should also wear a surgical mask*	Aerosol Generating Procedures[1] on Patients Susptected or Positive for COVID 19 AND Airway Procedures on All Patients
WHEN: • Patient has no COVID symptoms • Closer than 6 feet from patient for more than 1 minute **WHERE:** • Ambulatory Clinics • Emergency Department • Acute Care Units • Intensive Care Units • Procedural Areas **PPE Required:** • Surgical/ear loop mask	**WHEN:** • Patient has COVID symptoms OR has a COVID test pending or with positive result **WHERE:** • Ambulatory Clinics • Emergency Department • Acute Care Units • Intensive Care Units • Procedural Areas **PPE Required:** • Eye protection/face shield • Surgical/ear loop mask • Gown • Gloves	**WHEN:** • Aerosol generating procedures[1] are being performed **WHERE:** • Ambulatory Clinics • Emergency Department • Acute Care Units • Intensive Care Units • Procedural Areas **PPE Required:** • PAPR OR N95 Respirator + Face Shield/Eye Protection • Gown • Gloves

Note for all categories shown: Hand hygiene required upon entry and exit, regardless of whether the patient is under isolation, or PPE is worn.

[1] **Aerosol Generating Procedures Include But Are Not Limited to:** laryngoscopy/intubation, non-invasive ventilation, CPR, bronchoscopy, open suction, nasotracheal suction, nebulizer treatments

PPE for Specimen Collection: Nasopharyngeal swabs often generate a strong cough reflex. Standard/Contact/Droplet precautions are recommended.

Please see extended and re-use guidelines for N95 respirators.

What are the PPE recommendations for Delivery rooms and LSCS

Obstetric Anaesthetists' Association
Promoting the highest standards of anaesthetic practice in the care of mother and baby

The Faculty of Intensive Care Medicine

intensive care society 50 YEARS
proud to be the voice of critical care since 1970

Association of Anaesthetists

RCoA Royal College of Anaesthetists

Summary guidance from PHE/RCoA/AAGBI/RCOG relevant to obstetric anaesthetists

Antenatal /postnatal ward /clinic	Consultation/assessment >2 m distance from patient	FRSM, eye protection
Labour ward	Consultation/assessment if not in labour/1st stage labour e.g. consent for epidural analgesia	Apron, gloves, FRSM, eye protection
	Consultation/assessment in 2nd/3rd stage labour e.g. attending PPH	Apron, FRDG, gloves, FRSM, eye protection
	Epidural insertion	Apron, sterile FRDG, sterile gloves, FRSM, eye protection
Theatre	Caesarean section with neuraxial anaesthesia[1] (low risk of GA, e.g. elective CS for breech)	Apron, sterile[2] FRDG, sterile gloves, FRSM, eye protection
	Caesarean section with neuraxial anaesthesia (but higher risk of GA[3] e.g. Category 1 CS)	Apron, sterile FRDG, sterile gloves, **FRSM or FFP3**, eye protection
	Caesarean section with general anaesthesia	**Apron, FRDG, gloves, FFP3, eye protection**
Non-CS obstetric theatre cases	Trial of instrumental delivery in theatre, removal of retained placenta (with regional anaesthesia)	Apron, sterile FRDG, sterile gloves, FRSM, eye protection
	Any other case requiring general anaesthesia	**Apron, FRDG, gloves, FFP3, eye protection**

1. Neuraxial anaesthesia refers to epidural, spinal or combined spinal-epidural analgesia/anaesthesia.
2. Sterile only if de novo procedure, otherwise non-sterile acceptable.
3. Predictors of higher risk of GA conversion include:
- *Top up of pre-existing poorly functioning epidural, missed segments, unilaterality, breakthrough pain (consider removing and performing spinal).*
- *Anticipated difficult or prolonged surgery or haemorrhage, previous abdominal surgery, adhesions, classical incision, placenta praevia, multiple procedures, uterine structural abnormalities*

What PPEs recommended for OT staff, surgeons and anesthesiologists for patients with GA/ Endoscopy ?

- **Full PPE with respirator**
- **Face shield / goggles**

Use a surgical N-95 respirator/ equivalent without an expiration valve (expired air coming from the staff oropharynx through the one way valve may contaminate the surgical field with pathogens)

Do we need to do pre-testing of all patients before elective surgery?

- Follow standard precautions at all times
- Follow risk based assessments as indicated
- Treat all patient as infected (not limited to COVID-19)
- Current testing guideline by ICMR doesn't recommend pre-testing all patients before surgery
- **A negative COVID-19 test could be misleading**
  - Patients may turn up positive later if they are in early stages of infection
  - False negative COVID-19 tests are reported
    - Sample collection errors may result in false negative tests
    - COVID-19 laboratory tests do not have 100% Sensitivity and Specificity.

False-negative of RT-PCR and prolonged nucleic acid conversion in COVID-19: rather than recurrence.

Key findings:

- Among 70 COVID-19 patients with 2 consecutive negative PCR tests, 15 (21%) had a subsequent positive test result on RT-PCR using OP (oropharyngeal) or deep NP (nasopharyngeal) swabs

Methods: OP and NP swabs collected from patients after the onset of symptoms

***Limitations**:* patient inclusion criteria unclear; no description of timing, frequency, and intervals of specimen collection; methods of specimen collection, handling, and storage not described; Ct values of positive results not reported; no clinical or radiographic descriptions of those with recurrent positive test results; no information on test results following the positive test result

Implications of these two studies: Sporadic positive PCR test results can recur after clinical recovery and > 2 sequential negative tests. The significance of these positive results is unclear in the absence of Ct values and attempts to recover virus in culture

Xiao et al. Journal of Medical Virology (Apr 9, 2020)

Pre-symptomatic SARS COV-2 Infection and Transmission in a Skilled Nursing Facility

BACKGROUND

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection can spread rapidly within skilled nursing facilities. After identification of a case of Covid-19 in a skilled nursing facility, we assessed transmission and evaluated the adequacy of symptom-based screening to identify infections in residents.

METHODS

We conducted two serial point-prevalence surveys, 1 week apart, in which assenting residents of the facility underwent nasopharyngeal and oropharyngeal testing for SARS-CoV-2, including real-time reverse-transcriptase polymerase chain reaction (rRT-PCR), viral culture, and sequencing. Symptoms that had been present during the preceding 14 days were recorded. Asymptomatic residents who tested positive were reassessed 7 days later. Residents with SARS-CoV-2 infection were categorized as symptomatic with typical symptoms (fever, cough, or shortness of breath), symptomatic with only atypical symptoms, presymptomatic, or asymptomatic.

RESULTS

Twenty-three days after the first positive test result in a resident at this skilled nursing facility, 57 of 89 residents (64%) tested positive for SARS-CoV-2. Among 76 residents who participated in point-prevalence surveys, 48 (63%) tested positive. Of these 48 residents, 27 (56%) were asymptomatic at the time of testing; 24 subsequently developed symptoms (median time to onset, 4 days). Samples from these 24 presymptomatic residents had a median rRT-PCR cycle threshold value of 23.1, and viable virus was recovered from 17 residents. As of April 3, of the 57 residents with SARS-CoV-2 infection, 11 had been hospitalized (3 in the intensive care unit) and 15 had died (mortality, 26%). Of the 34 residents whose specimens were sequenced, 27 (79%) had sequences that fit into two clusters with a difference of one nucleotide.

CONCLUSIONS

Rapid and widespread transmission of SARS-CoV-2 was demonstrated in this skilled nursing facility. More than half of residents with positive test results were asymptomatic at the time of testing and most likely contributed to transmission. Infection-control strategies focused solely on symptomatic residents were not sufficient to prevent transmission after SARS-CoV-2 introduction into this facility.

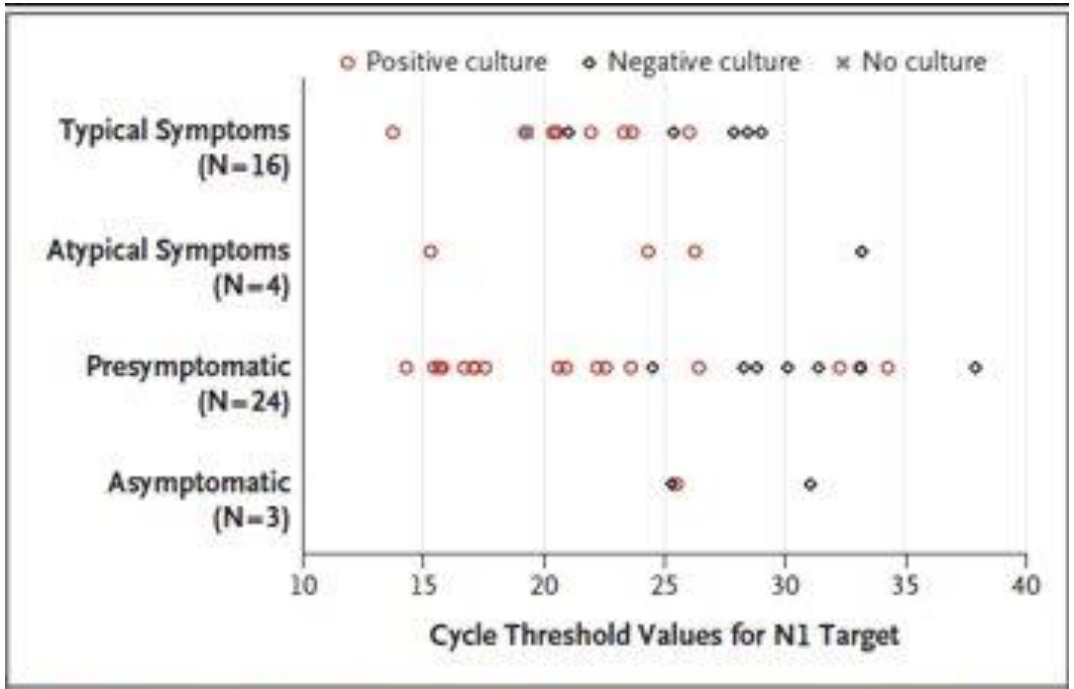


Figure 2. Cycle Threshold Values and Results of Viral Culture for Residents with Positive SARS-CoV-2 Tests According to Their Symptom Status.

Shown are N1 target cycle threshold values and viral culture results for 47 residents' first positive test for SARS-CoV-2 stratified by the resident's symptom status at the time of the test. One positive test was not assessed for culture growth. Typical symptoms include fever, cough, and shortness of breath; atypical symptoms include chills, malaise, increased confusion, rhinorrhea or nasal congestion, myalgia, dizziness, headache, nausea, and diarrhea.

https://www.nejm.org/doi/full/10.1056/NEJMoa2008457

Example of asymptomatic COVID-19 positive patients presenting for care

Universal screening for SARS-CoV-2 in women admitted for delivery in New York City

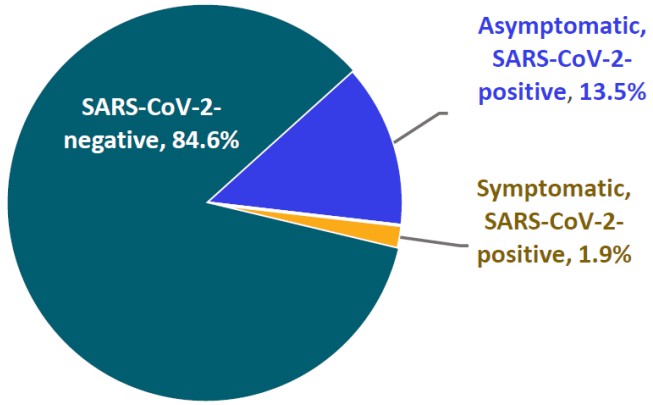
Key Findings:

- Among 215 women admitted to labor and delivery, SARS-CoV-2 was detected in 15% on admission.
- Of 33 women who tested positive for SARS-CoV-2, 88% had no symptoms at presentation when tested.
- Of the 29 asymptomatic women who tested positive for SARS-CoV-2, 10% developed fevers in hospital.
- One woman testing negative on admission developed symptoms post-partum and subsequently tested positive for SARS-CoV-2.

Methods: Prospective case series of 215 pregnant women admitted to 2 New York City hospitals for labor and delivery. All women were screened on admission for SARS-CoV-2 by RT-PCR (nasopharyngeal swabs). Participants were monitored for symptom onset during their hospital stay. *Limitations*: generalizability limited to regions with similar disease prevalence; potential for false-negative tests on admission.

Implications: In this NYC-based study, 15% of pregnant women tested positive for SARS-CoV-2 on admission or during their hospital stay. The majority were asymptomatic, reinforcing utility of testing women presenting for delivery to inform control measures (e.g., isolation and use of PPE).

Figure:



Note: Adapted from Sutton *et al.* Chart shows the SARS-CoV-2 test status and percent symptomatic on admission for 215 obstetric patients in 2 NYC hospitals. **84.6% were SARS-CoV-2 negative, 1.9% were symptomatic and SARS-CoV-2 positive,** and **13.5% were asymptomatic and SARS-CoV-2 positive**. This figure does not illustrate the 3 asymptomatic test positive women who later developed symptoms, or the one test negative women who developed symptoms and subsequently tested positive.

Sutton D et al. ***https://www.nejm.org/doi/full/10.1056/NEJMc2009316***

What PPE should be worn by HCW providing care to an asymptomatic patients with a history of exposure to a COVID-19 positive case who are being evaluated for a non-infectious complaint (HTN) ?

- Standard Precautions should be followed when caring for any patient, regardless of suspected or confirmed COVID-19
- If the patient is afebrile and otherwise without even mild symptoms* that might be consistent with COVID-19 (e.g., cough, sore throat, shortness of breath), then **precautions specific to COVID-19 are not required**
- However, until the patient is determined to be without such symptoms, HCP should wear all recommended PPE for the patient encounter
- If the primary evaluation confirms the patient is without symptoms, management and need for any Transmission-Based Precautions should be based with the condition for which they are being evaluated (e.g., patient colonized with a drug-resistant organism), rather than potential exposure to COVID-19

*Note: In addition to cough and shortness of breath, nonspecific symptoms such as sore throat, myalgia, fatigue, nausea, and diarrhea have been noted as initial symptoms in some cases of COVID-19. These symptoms can have several alternative explanations; however, failure to identify and implement proper precautions in a healthcare setting for persons infected with COVID-19 can contribute to widespread transmission in that facility due to the presence of susceptible patients and close interactions with healthcare personnel. For this reason, a lower temperature of 100.0 F and the inclusion of mild and non-specific symptoms should be used by healthcare settings evaluating these patients to increase the ability to detect even mild cases of COVID-19.

https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-faq.html

SARS COV-2 Transmission according to stage of Infection

Table 2. SARS-CoV-2 Transmission According to Stage of Infection.

Stage of Infection*	RNA Detectable in Respiratory Samples, Blood, and Feces	Viable Virus Detectable in Respiratory Samples	Transmission Can Occur	Mechanism of Transmission†						Minimum Recommended Level of Precautions
				Droplet	Natural Aerosol	Aerosol-Generating Procedure	Direct Contact	Indirect Contact	Enteric Route	
Presymptomatic‡	Yes	Yes	Yes§	Yes	Suspected	Suspected	Suspected	Suspected	Unknown	Eye protection (goggles or face shield) Protection from droplet and contact transmission during routine care Protection from airborne and contact transmission during aerosol-generating procedure
Symptomatic	Yes	Yes	Yes	Yes	Suspected	Yes	Strongly suspected	Strongly suspected	Unknown	Eye protection (goggles or face shield) Protection from droplet and contact transmission during routine care Protection from airborne and contact transmission during aerosol-generating procedure
Postsymptomatic	Yes for limited time, occasionally prolonged	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	None

* The incubation period of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), from exposure to symptom onset, ranges from 2 to 14 days. The infectious dose is unknown. The possibility that people who remain asymptomatic throughout infection can transmit the virus remains a topic of debate. The presymptomatic stage occurs 1 to 3 days (or possibly longer) before symptom onset. The postsymptomatic stage occurs a minimum of 7 days after symptom onset and at least 3 days after the resolution of fever and improvement in respiratory symptoms.

† In transmission by droplet, large (≥5 μm) respiratory particles that are released by coughing, sneezing, or speaking land on surfaces or mucosal membranes. In transmission by natural aerosol, small (<5 μm) respiratory particles that are generated by human activities (e.g., singing) are inhaled; this does not necessarily indicate long-distance airborne transmission. In transmission by an aerosol-generating procedure, small respiratory particles that are generated by clinical procedures (e.g., intubation, extubation, use of nebulizers, or bronchoalveolar lavage) are inhaled; this does not necessarily indicate long-distance airborne transmission. In transmission by direct contact, the virus is transferred by body-surface contact. In transmission by indirect contact, the virus is transferred from a contaminated surface to a mucosal surface (e.g., eyes, nose, or mouth). In enteric transmission, the virus is transferred by the fecal–oral route; SARS-CoV-2 RNA has been detected in stool but fecal–oral spread has not been documented.

‡ Testing of patients without symptoms may be performed for preoperative screening, during pregnancy at the time of delivery, when they are unable to provide a medical or exposure history, when they live in a high-risk setting (e.g., congregate settings, including long-term care facilities), or during community surveillance activities.

§ This information is based on case reports or case series.

https://www.nejm.org/doi/full/10.1056/NEJMcp2009249?query=featured_coronavirus

What is the risk of infection if I don't have PPE?

Health care personnel (HCP) are at heightened risk of acquiring COVID-19 infection, but limited information exists about transmission in health care settings.

- Report of 121 US HCP exposed to a patient with unrecognized COVID-19
  - 43 became symptomatic and were tested for SARS-CoV-2, of whom three had positive test results; all three had unprotected patient contact.
  - Exposures while performing physical examinations or during nebulizer treatments were more common among HCP with COVID-19.
- Unprotected, prolonged patient contact, as well as certain exposures, including some aerosol-generating procedures, were associated with SARS-CoV-2 infection in HCP
- Early recognition and isolation of patients with possible infection and recommended PPE use can help minimize unprotected, high-risk HCP exposures and protect the health care workforce

Heinzerling A, Stuckey MJ, Scheuer T, et al. Transmission of COVID-19 to Health Care Personnel During Exposures to a Hospitalized Patient — Solano County, California, February 2020. MMWR Morb Mortal Wkly Rep. ePub: 14 April 2020. DOI: http://dx.doi.org/10.15585/mmwr.mm6915e5external icon.

When should transmission-based precautions be discontinued for COVID-19 patients?

- The decision to discontinue Transmission-Based Precautions can be made using a test-based strategy or a non-test-based strategy. Meeting criteria for discontinuation of Transmission-Based Precautions is not a prerequisite for discharge.

- *Test-based strategy:*
  - Resolution of fever without the use of fever-reducing medications **and**
  - Improvement in respiratory symptoms (e.g., cough, shortness of breath), **and**
  - Negative PCR results from at least two consecutive nasopharyngeal swab specimens collected ≥24 hours apart (a total of two negative specimens)

- *Non-test-based strategy:*
  - At least 3 days (72 hours) have passed *since recovery* defined as resolution of fever without the use of fever-reducing medications **and** improvement in respiratory symptoms (e.g., cough, shortness of breath); **and**,
  - At least 7 days have passed *since symptoms first appeared*

https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Finfection-control%2Fcontrol-recommendations.html

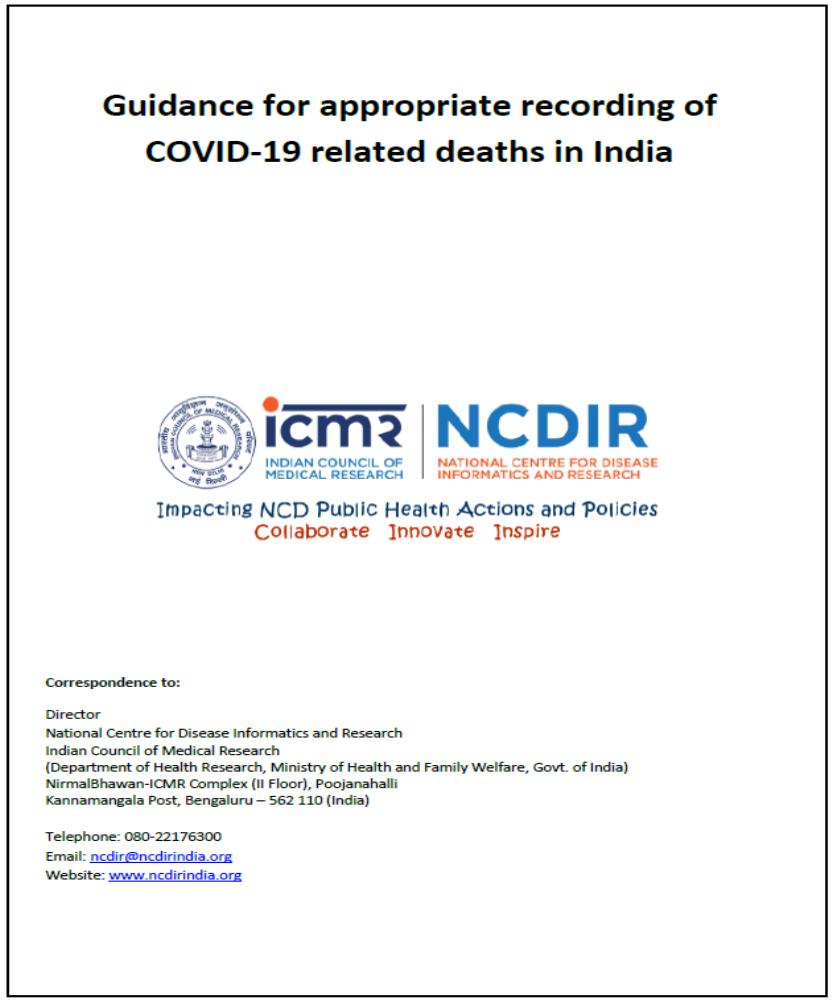
How can I decontaminate a ventilator?

- When mechanical ventilators are used in the care of a patient with an ARI of potential concern, **bacterial and viral filters are recommended on exhalation valves**
- Disinfect tubing using sodium hypochlorite solution of 0.1% or 1000 ppm, ensuring that the entire lumen of the tubing is flushed
- Wipe down the controls and entire outside of the equipment with a compatible disinfectant (e.g. sodium hypochlorite solution of 0.05% or 500 ppm for non-metal surfaces)
- Expiratory tubing should be disassembled and cleaned first with a detergent, rinsed clean, and then subjected to either high-level disinfection or sterilization
- It is not necessary to routinely clean respiratory and pressure lines within a ventilator between patients, because the lines are not exposed to the patient or the patient's respiratory secretions

Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections – WHO guidelines
https://www.who.int/csr/bioriskreduction/infection_control/publication/en/

Topic – Medical Certification of COVID-19 Deaths and Dead Body Management

National Guidelines on Managing the Suspected / Confirmed Deaths due to COVID-19



Guidance for appropriate recording of COVID-19 related deaths in India

icmr INDIAN COUNCIL OF MEDICAL RESEARCH | NCDIR NATIONAL CENTRE FOR DISEASE INFORMATICS AND RESEARCH

Impacting NCD Public Health Actions and Policies

Collaborate Innovate Inspire

Correspondence to:

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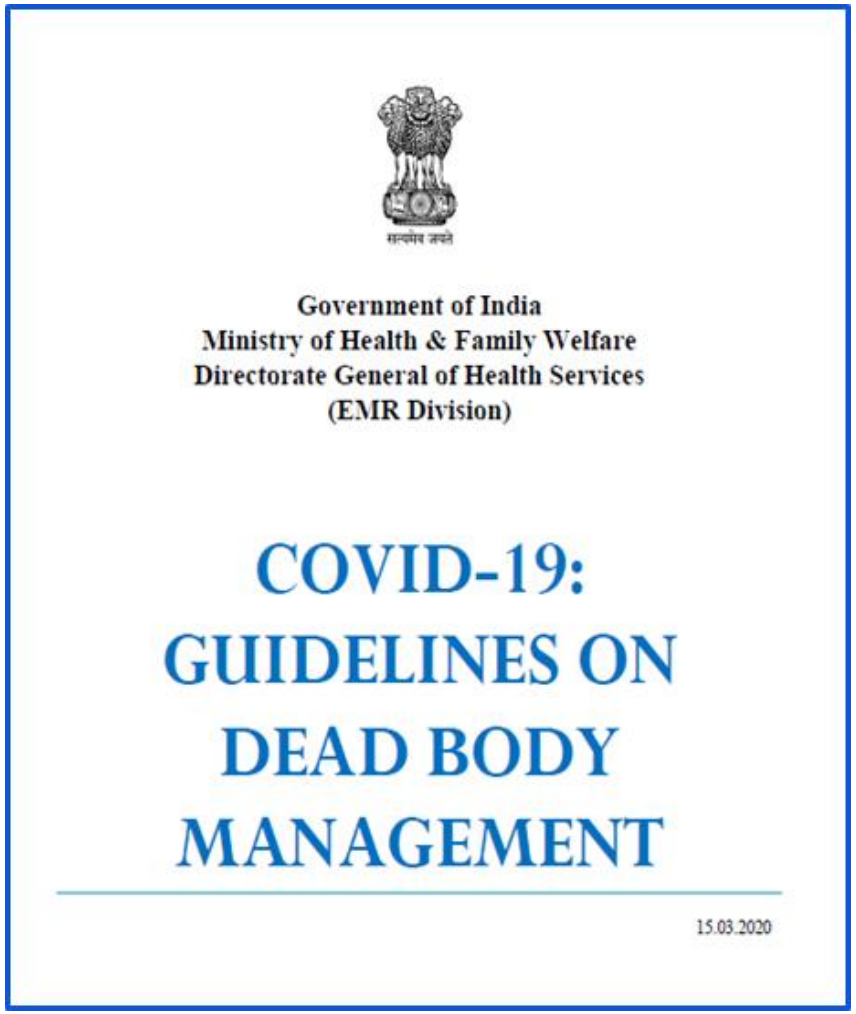
National Centre for Disease Informatics and Research
Indian Council of Medical Research
(Department of Health Research, Ministry of Health and Family Welfare, Govt. of India)
NirmalBhawan-ICMR Complex (II Floor), Poojanahalli
Kannamangala Post, Bengaluru – 562 110 (India)

Telephone: 080-22176300
Email: ncdir@ncdirindia.org
Website: www.ncdirindia.org



Government of India
Ministry of Health & Family Welfare
Directorate General of Health Services
(EMR Division)

COVID-19:
GUIDELINES ON
DEAD BODY
MANAGEMENT

15.03.2020

https://www.icmr.gov.in/pdf/covid/techdoc/Guidance_appropriate_recording_of_related_deaths_India.pdf

MoHFW guidelines on dead body management

Use of body bag
Place the dead body in leak-proof plastic body bag. The exterior of the body bag can be decontaminated with 1% hypochlorite
Disinfection of the body before removing from the isolation area
Any puncture holes or wounds (resulting from removal of catheter, drains, tubes, or otherwise) should be disinfected with 1% hypochlorite and dressed with impermeable material.
Disinfection of high touch surfaces
After removing the body, the chamber door, handles and floor should be cleaned with sodium hypochlorite 1% solution
The old and the immunocompromised
No recommendation
Attendees with respiratory symptoms
No recommendation
Autopsies https://www.icmr.gov.in/pdf/covid/techdoc/COVID19_AUTOPSY_GUIDELINES_2020_10052020.pdf
Autopsies should be avoided unless medico legally indicated: Done with appropriate PPE and recommended equipment
Decontamination of transport vehicle
The vehicle, after the transfer of the body to cremation will be decontaminated with 1% Sodium hypochlorite

Can I get COVID-19 from a dead body?

- To date there is no evidence of persons having become infected from exposure to the bodies of persons who died from COVID-19
- The belongings of the deceased person do not need to be burned or otherwise disposed of
  - Belongings should be handled with gloves and cleaned with a detergent followed by disinfection with a solution of at least 70% ethanol or 0.1% (1000 ppm) bleach
- According to the WHO, except for hemorrhagic fevers (such as Ebola, Marburg) and cholera, dead bodies are generally not infectious
- The lungs of patients with pandemic influenza, if handled improperly during an autopsy, can be infectious

https://apps.who.int/iris/bitstream/handle/10665/331538/WHO-COVID-19-IPC_DBMgmt-2020.1-eng.pdf

What are the recommendations for PPE in post mortem cases?

- Personnel who interact with the body (health care or mortuary staff, or the burial team) should:
  - Follow standard precautions, including hand hygiene before and after interaction with the body, and the environment
  - Use appropriate PPE according to the level of interaction with the body
    - Gown
    - Gloves
  - If there is a risk of splashes from the body fluids or secretions, should use
    - Face shield / goggles
    - N 95 respirator

1. https://www.mohfw.gov.in/pdf/1584423700568_COVID19GuidelinesonDeadbodymanagement.pdf
2. https://apps.who.int/iris/bitstream/handle/10665/331538/WHO-COVID-19-IPC_DBMgmt-2020.1-eng.pdf

When should I a collect COVID-19 sample from a dead body?

- The need to investigate the cause of death should be decided on a case by case basis. Reasons for collection may be:
  - to confirm the diagnosis (which could not be done before death)
  - to aid surveillance efforts like tracing of contacts

- For suspected COVID-19 cases, CDC recommends:
  - Collecting and testing postmortem nasopharyngeal swabs (NP swabs)
  - If an autopsy is performed collect lower respiratory specimens (lung swabs)
  - If the diagnosis of COVID-19 was established before death, collection of these specimens for COVID-19 testing may not be necessary

1. Infection Prevention and Control for the safe management of a dead body in the context of COVID-19- WHO - https://apps.who.int/iris/handle/10665/331538
2. https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-postmortem-specimens.html

How is COVID-19 recorded as a cause of death?

- COVID-19 is reported to cause pneumonia, acute respiratory distress syndrome (ARDS), cardiac injury, disseminated intravascular coagulation, etc.
- The conditions caused by COVID-19 may lead to death and may be recorded on the death certificate on line ‘a’ or ‘b’
- It is likely that COVID-19 is the underlying cause of death (UCOD) that lead to ARDS or Pneumonia in most of the deaths due to COVID-19 (test positive and symptoms positive)
- In these cases COVID-19 must be captured in the last line / lowest line of Part 1 of MCCD form 4/4 A

*** Acute respiratory failure is a mode of dying and it is prudent not to record it on line a, b, or c**

https://www.icmr.gov.in/pdf/covid/techdoc/Guidance_appropriate_recording_of_related_deaths_India.pdf

Mortality coding of COVID-19 with ICD-10 codes

Test	Symptoms of COVID-19	Diagnosis	Code
+ve	None	Confirmed COVID-19	U07.1
+ve	Present	Confirmed COVID-19 documented as UCOD	U07.1
+ve	Present with comorbid conditions like heart disease, asthma, COPD, Type 2 diabetes	Confirmed COVID-19 documented as UCOD	U07.1
Test Negative	Present	Clinically –Epidemiologically diagnosed COVID -19	U07.2
Test awaited	Present	Suspected COVID-19	
Test inconclusive	Present	Probable COVID-19	

https://www.icmr.gov.in/pdf/covid/techdoc/Guidance_appropriate_recording_of_related_deaths_India.pdf

Examples: Reporting underlying cause of death in COVID-19 Form 4/ 4A

	CAUSE OF DEATH	Interval between onset and death approx
I **Immediate cause** State the disease,injury or complication which caused death,not the mode of dying such as heart failure, asthenia,etc	a).....	.....
	due to (or as a consequences of)	
Antecedent cause Morbid conditions,if any,giving rise to the above cause stating underlying conditions last.	b).....	.....
	due to (or as a consequences of)	
	c).....	.....
II Other significant conditions contributing to the death but not related to the disease or condition causing it	.....	.....
	.....	.....
	.....	.....
	.....	.....
	.....	.....
	.....	.....

https://www.censusindia.gov.in/2011-Documents/mccd_Report1/Physician's_Manual_MCCD.pdf

Example - 40 year old male diagnosed with COVID-19

CAUSE OF DEATH			
Part I		**Interval between onset and death approx**	**For statistical use**
Immediate Cause State the disease, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc	a) Respiratory acidosis	2 days	
Antecedent cause Morbid conditions, if any, giving rise to the above cause stating underlying conditions last.	b) Acute respiratory distress syndrome (ARDS) c) COVID-19	3 days 7 days	**U07.1**
Part II Other significant conditions contributing to the death but not related to the disease or condition causing it.	…… …… ……		

https://www.icmr.gov.in/pdf/covid/techdoc/Guidance_appropriate_recording_of_related_deaths_India.pdf

Example - 60 year old male, father of COVID-19 patient and a known diabetes individual presented with influenza like illness (ILI) and died, test for COVID-19 not available

Part I		Interval between onset and death approx	For statistical use
Immediate Cause State the disease, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc	a) Acute respiratory distress syndrome (ARDS)	1 day	
Antecedent cause Morbid conditions, if any, giving rise to the above cause stating underlying conditions last.	b) Influenza like illness c) COVID-19 suspect	4 days 4 days	**U07.2**
Part II Other significant conditions contributing to the death but not related to the disease or condition causing it.	Diabetes	15 years	

https://www.icmr.gov.in/pdf/covid/techdoc/Guidance_appropriate_recording_of_related_deaths_India.pdf

OTHER TOPICS WILL BE ADDED IN PART-3

Additional FAQ Resources

https://www.mohfw.gov.in/ (Resources and Training Materials Tab)

https://www.who.int/news-room/q-a-detail/q-a-coronaviruses

https://www.cdc.gov/coronavirus/2019-ncov/faq.html

Acknowledgement

- Ministry of Health and Family Welfare, Government of India
- National Centre for Disease Control, New Delhi
- National AMR Surveillance Network Sites- NCDC, New Delhi
- HAI Surveillance Network, JPNATC AIIMS, New Delhi
- Regional Centers, HAI Surveillance Network, AIIMS-ICMR*
- The Tamil Nadu Dr MGR Medical University, Chennai
- Indian Medical Association, Tamil Nadu State Branch
- National Cancer Grid, India
- US Centers for Disease Control and Prevention
  - India Country Office, New Delhi
  - International Infection Control Program, Atlanta, USA

IPC Capacity Building Regional Sites- HAI Surveillance

1. AIIMS - New Delhi
2. Safdarjung Hospital - New Delhi
3. Hinduja Hospital - Mumbai
4. KGMU - Lucknow
5. PGIMER - Chandigarh
6. Amirtha Institute of Medical Sciences - Cochin
7. AIIMS - Jodhpur
8. Tata Medical Centre - Kolkata

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These FAQs were constructed based on the questions raised during the IPC virtual training by AIIMS- ICMR Healthcare Associated Infection (HAI) Surveillance Network and NCDC –National AMR surveillance network. They are based on the available scientific evidence as of 16 May 2020 in consensus with experts from regional centers for IPC under AIIMS- ICMR HAI surveillance regional centers.

Please note these recommendations might change as more evidence evolves regarding COVID-19.

The findings and conclusions in this report do not necessarily represent the official position of the US Centers for Disease Control and Prevention.